

DOCKET NO: 268510US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
BERND ZASCHKE, ET AL. : EXAMINER: COONEY, J.
SERIAL NO: 10/530,707 :
FILED: APRIL 8, 2005 : GROUP ART UNIT: 1711
FOR: METHOD FOR PRODUCING RIGID :
POLYURETHANE FOAMS BY MEANS
OF GRAFT POLYHYDRIC ALCOHOLS

SUPPLEMENTAL APPEAL BRIEF

SIR:

The following is a supplemental appeal brief of appellants' appeal of March 21, 2008 of the examiner's final rejection of December 7, 2007 of claims 1-15 and 17-19 as anticipated and/or obvious. The Notice of Non-Compliant Appeal Brief of May 2, 2008 identified deficiencies in failing to identify each independent claim by number and separately arguing each of the 4 grounds of rejection under separate headings. These deficiencies are addressed in this supplemental appeal brief as follows:

(i) Real Party In Interest

The real party in interest is BASF Aktiengesellschaft, now, BASF SE, by assignment recorded at reel/frame 016486/0992-0994.

(ii) Related Appeals And Interferences

Appellants, appellants' legal representative and the assignee are not aware of any related appeals and interferences which will directly affect or be directly affected, or have a

bearing on the Board's decision in the pending appeal. Any copies of decisions rendered by a court or the Board, if any, in any proceeding identified would be attached as related proceedings appendix (x).

(iii) Status Of Claims

Appellants' state the status of all the claims in the proceeding as follows:

Claims 1-15 and 17-19 are rejected and active in this application and are herein appealed.

No claims have been identified as allowed or confirmed.

No claims have been identified as withdrawn.

No claims have been identified as objected to.

Claim 16 has been canceled.

(iv) Status Of Amendments

No amendments have been filed subsequent to final rejection. A statement as to status is not applicable.

A copy of the claims herein appealed, is attached as appendix (viii).

(v) Summary Of Claimed Subject Matter

The claimed invention (independent claim 1) is directed to a process for producing closed-celled rigid polyurethane foams by reacting (page 2, lines 34-35 and page 3, lines 7-8)

- a) crude MDI having an NCO content of from 29 to 33% by weight and a viscosity at 25°C in the range from 150 to 1000 mPa•s with (column 8, lines 33-36)
- b) compounds having at least two hydrogen atoms reactive toward isocyanate groups, in the presence of (page 2, lines 39-40)
- c) catalysts, and (page 2, line 42)
- d) blowing agents, (page 2, line 44)

which comprises the presence, among the compounds having at least two hydrogen atoms reactive toward isocyanate groups, of at least one graft polyol (page 3, lines 1-3), wherein said closed-celled rigid polyurethane has a proportion of closed cells in the foam of at least 88% (page 3, lines 7-10).

The claimed invention (independent claim 13) also directed to a graft polyol comprising polymerized ethylenically unsaturated monomers in polyether alcohols having a hydroxy value in the range from 100 to 600 mg KOH/g, obtained by an addition reaction of alkylene oxides onto H-functional starter substances, the starter substances having been selected from the group consisting of polyfunctional alcohols, sugar alcohols, aliphatic amines, and aromatic amines (page 6, lines 17-31 and claim 13 as originally presented).

Claims 1 and 13 are the only independent claims.

Rigid polyurethane foams having a closed-cell structure are known for thermal insulation. Reduced molding times and good mold flow properties are still sought in closed-celled rigid polyurethane foam producing processes.

The claimed invention addresses this problem by providing a process for preparing rigid closed-cell polyurethane foam having **a proportion of closed cells of at least 88%** comprising reacting MDI having **an NCO content of from 29-33% and specified viscosity** with a compound having at least two reactive hydrogen atoms comprising comprises at least one graft polyol in the presence of catalyst and a blowing agent. Appellants have discovered that a graft polyol provides for good properties in the process for producing a closed-celled rigid polyurethane foam. Such a process or graft polyol are nowhere disclosed or suggested in the cited art of record.

No means plus function or step plus function as permitted by 35 U.S.C. 112, sixth paragraph are used and therefore none are identified.

(vi) Grounds Of Rejection To Be Reviewed On Appeal

1) The rejection of claims 1-6, 12, 13 and 17-19 under 35 U.S.C. § 102(b) over Heyman et al. U.S. 5,919,972 is presented for review.

2) The rejection of claims 7-11 and 14-15 under 35 U.S.C. § 103(a) over Heyman et al. U.S. 5,919,972 in view of EP 786,480 and Isobe et al. U.S. 6,433,033 is presented for review.

3) The rejection of claims 13 and 19 under 35 U.S.C. § 102(b) over Perry et al. U.S. 6,127,443 is presented for review.

4) The rejection of claims 14-15 under 35 U.S.C. § 103(a) over Perry et al. U.S. 6,127,443 in further view of Isobe et al. U.S. 6,433,033 is presented for review.

(vii) Arguments

The rejection of claims 1-6, 12, 13 and 17-19 under 35 U.S.C. § 102(b) over Heyman et al. U.S. 5,919,972

Claims 1-6, 12 and 17-18

This embodiment of the claimed invention is directed to a process for producing a closed-celled rigid polyurethane and a rigid polyurethane foam.

The examiner has committed reversible error in concluding the claimed invention to be anticipated over the cited reference as the cited art of record fails to disclose or suggest the claimed 1) at least 88% closed cell structure or 2) the claimed crude MDI NCO content of 29 to 33% and viscosity of 150 to 1000 mPa.s.

Heyman et al. fails to disclose or suggest the claimed process of producing a **closed-cell** rigid polyurethane foam having a **proportion of closed cells of at least 88%**.

Heyman et al. describes **an open cell foam** and therefore fails to describe a closed-celled rigid polyurethane foam having a proportion of closed cells of at least 88%.

The **evidence** of the disclosure of an open cell foam is as follows:

Heyman et al. describes a water blown molded polyurethane foam which exhibits little or no shrinkage.

“Water blown molded polyurethane foams prepared with this graft polymer dispersion exhibit **little or no shrinkage**.” (column 1, lines 15-17).

“Molded polyurethane foams manufactured from this graft polymer dispersion are dimensionally stable and exhibit **little or no shrinkage**.” (column 1, lines 60-62).

The reference describes the known use of low activity surfactants to reduce foam shrinkage.

“The various attempts made to **reduce foam shrinkage** included using **low activity surfactants**, reducing the amount of ethylene oxide termination on the polyether polyol to slow its reactivity, or using a graft polymer dispersion prepared by the continuous process rather than by the semi-batch process.”(column 1, lines 26-27)

A surface active agent is used in order to achieve the goal of a high grade polyurethane.

“A surface-active agent is generally **necessary for production of high grade polyurethane** foam according to the present invention, since in the absence of same, the foams collapse or contain very large uneven cells.”(column 10, lines 18-21)

Accordingly, Heyman et al. is directed to a polyurethane having low shrinkage and incorporates a surfactant in order to prevent foam collapse and to have even cells.

However, the procedures practice by Heyman et al. are used to provide a polyurethane foam having **an open cell structure**. An open cell structure is evidenced by the disclosure of Gallagher U.S. 5,208,271 which reports the reduction or elimination of foam shrinkage by addition of a surfactant which **opens cells** in the foam, a result which previously necessitated mechanical crushing.

“The **elimination of foam shrinkage by opening the cells** using new types of surfactants was the topic of a paper by D. R. Battice, et al., New Cell Opening Surfactants For Molded High Resiliency Polyurethane Foam, 30th Annual Polyurethane Technical Marketing Conference, Oct. 15-17, 1986, pp. 145-148. The new **surfactants that promoted good cell drainage and eliminated foam shrinkage** were identified as X2-5249 and X2-5256, both silicone-based and manufactured at the time by Dow Corning. These surfactants successfully reduced foam shrinkage over a previous Dow Corning® 5043 surfactant.” (column 1, lines 24-35)

“It has been found that perfluoro sulfonamide surfactants used in the invention **prevent shrinkage** of molded flexible polyurethane foams, **avoiding the necessity for mechanical crushing**, and provide suitable alternatives to silicone-based surfactants.” (column 1, line 67 through column 2, line 3)

“To obtain a flexible foam adequately stabilized against collapse and having a good closed-cell structure, it is known to add a surfactant. A flexible foam having **a high number of closed cells, however, leads to shrinkage**. One means generally employed to open the cells and **eliminate foam shrinkage is to mechanically treat the foam by crushing with rollers**, with a vacuum technique, or by lancing. It would be desirable, however, to produce a surfactant that stabilizes the foam against collapse while **opening the cells of the foam without the necessity for mechanical treatment.**”
(column 1, lines 13-23)

Thus, in this area of technology, addition of a surfactant will prevent shrinkage by **opening the cell structure**, without the need for crushing. It is also known that a high number of closed cells produces a foam subject to shrinkage.

Accordingly, since Heyman et al. is directed to a shrinkage reduce polyurethane foam and **adds a surfactant**, which was found to be necessary to produce such a foam, it is clear that the foam of Heyman et al. has a predominantly open cell structure and does not have **at least 88% closed cells**.

While the official action asserts a closed cell structure is inherent to Heyman et al. appellants have provided evidence to the contrary.

Further, appellants have previously noted the physical characterization appearing in Table 2, at column 12 of Heyman et al. which describes air flow properties of 0.63-2.08, air flow being a property which can only be measured for foams having predominately open cells as closed cells prevent an air flow through the foam. While the examiner has noted that the air flow measurements are measured after crushing, leading the examiner to the conclusion that the reference is directed to a closed cell foam, the further characterization of the reference of “low shrinkage” leads to the contrary conclusion. If the foam of Heyman et al. were of a closed cell

proportion of at least 88%, the foam of Heyman et al. would not perform as a low shrinkage foam. Samples 2 and 3 in Table 2, **inventive samples** according to Heyman et al. exhibited shrinkage distances of only 2/0 and 0/0 mm, clearly identifying these foams as low shrinkage. The absence of significant shrinkage is evidence that the Heyman et al foams do not have a closed cell proportion of at least 88%.

In contrast, the claimed invention is directed to a process for producing **closed-celled** rigid polyurethane foams having a proportion of closed cells of at least 88%. Such foams are useful for thermal insulation and for construction and have fundamentally different properties from those of the foam of Heyman et al.

Thus the examiner has failed to establish that the claimed invention is anticipated, as the examiner has failed to provide evidence of the claim limitation of **a proportion of closed cells of at least 88%**.

Rather than provide any **evidence** of this claim limitation, the examiner merely **decrees** “it is held that Heyman et al’s disclosure is inherently concerned with formation of articles that are closed celled to the degree claimed by applicants” (page 2 of official action September 5, 2007). Such assertions do not rebut the evidence provided by appellants as to why Heyman et al. fails to suggest a closed cell content of at least 88%. To the contrary, appellants have provided evidence that Heyman et al. is directed to an open celled foam, which would not have a closed cell content of at least 88%.

The examiner erroneously relies on unsupported conclusions in maintaining his rejection. Moreover, the examiner has erroneously weighed his unsupported conclusion more heavily than appellants evidence. As the examiner’s conclusion is not supported by any

evidence and appellants have provided evidence as to the lack of anticipation, the examiner's conclusion is in error and must be reversed.

Notwithstanding the failure of Heyman et al. to describe a foam having a closed cell content of at least 88%, the reference fails to disclose a further claimed aspect of the invention as follows:

Heyman Et Al. Fail To Describe An MDI Having And NCO Content Of 29-33% And A Viscosity Of 150 To 1000 mPa·S

The official action, on page 2, asserts that based on the materials employed in the making of the foams of Heyman et al. **it is held** that the disclosure is inherently concerned with formation of articles that are closed celled to the degree claimed by applicants.

However, Heyman et al. never describes an MDI having an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s. Column 9, lines 5-30 of Heyman et al. describes the polyisocyanate component but nowhere describes the claim limitations of an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s. In the absence of a disclosure of this claim limitation the claimed process is clearly not rendered obvious by this reference.

There is no evidence to support the examiner's assertion that the claimed isocyanate component is inherent to Heyman et al. Moreover, as appellants have pointed out the difference between the claimed closed cell rigid polyurethane and the open celled polyurethane of Heyman et al., the error in the conclusion of the examiner as to the inherent NCO content and viscosity is further demonstrated.

As Heyman et al. fails to disclose or suggest a closed-celled rigid polyurethane foam having a proportion of closed cells of at least 88% producing process nor a polyisocyanate

component having an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s, the claimed invention is clearly neither anticipated nor rendered obvious from this reference. The decision of the examiner must be reversed.

In view of the examiner's errors the examiner's decision must be reversed.

The Rejection Of Claims 7-11 And 14-15 Under 35 U.S.C. § 103(A) Over Heyman Et Al. U.S. 5,919,972 In View Of EP 786,480 And Isobe Et Al. U.S. 6,433,033

Claims 7-11 and 14-15

This embodiment of the claimed invention is directed to a process for producing a closed-celled rigid polyurethane and a rigid polyurethane foam in which the graft polyol particle size distribution is characterized (claims 7-8) the composition of the graft polyol is characterized (claims 9-11 and 14-15).

The arguments as to the deficiencies of Heyman et al. as to issue 1) are repeated below. New arguments as to the secondary references begin on page 15 of this brief.

The examiner has committed reversible error in concluding the claimed invention to be obvious over the cited references as the cited art of record fails to disclose or suggests the claimed limitations of 1) at least 88% **closed cell** structure or 2) the claimed crude MDI NCO content of 29 to 33% and viscosity of 150 to 1000 mPa·s.

Heyman et al. **fails** to disclose or suggest the claimed process of producing a **closed-cell** rigid polyurethane foam having a **proportion of closed cells of at least 88%**.

Heyman et al. describes **an open cell foam** and therefore fails to describe a closed-celled rigid polyurethane foam having a proportion of closed cells of at least 88%.

The **evidence** of the disclosure of an open cell foam is as follows:

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“Water blown molded polyurethane foams prepared with this graft polymer dispersion exhibit **little or no shrinkage**.” (column 1, lines 15-17).

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The reference describes the known use of low activity surfactants to reduce foam shrinkage.

“The various attempts made **to reduce foam shrinkage** included using **low activity surfactants**, reducing the amount of ethylene oxide termination on the polyether polyol to slow its reactivity, or using a graft polymer dispersion prepared by the continuous process rather than by the semi-batch process.”(column 1, lines 26-27)

A surface active agent is used in order to achieve the goal of a high grade polyurethane.

“A surface-active agent is generally **necessary for production of high grade polyurethane** foam according to the present invention, since in the absence of same, the foams collapse or contain very large uneven cells.”(column 10, lines 18-21)

Accordingly, Heyman et al. is directed to a polyurethane having low shrinkage and incorporates a surfactant in order to prevent foam collapse and to have even cells.

However, the procedures practice by Heyman et al. are used to provide a polyurethane foam having **an open cell structure**. An open cell structure is **evidenced** by the disclosure of Gallagher U.S. 5,208,271 which reports the reduction or elimination of foam shrinkage by

addition of a surfactant which **opens cells** in the foam, a result which previously necessitated mechanical crushing.

“The **elimination of foam shrinkage by opening the cells** using new types of surfactants was the topic of a paper by D. R. Battice, et al., New Cell Opening Surfactants For Molded High Resiliency Polyurethane Foam, 30th Annual Polyurethane Technical Marketing Conference, Oct. 15-17, 1986, pp. 145-148. The new **surfactants that promoted good cell drainage and eliminated foam shrinkage** were identified as X2-5249 and X2-5256, both silicone-based and manufactured at the time by Dow Corning. These surfactants successfully reduced foam shrinkage over a previous Dow Corning® 5043 surfactant.” (column 1, lines 24-35)

“It has been found that perfluoro sulfonamide surfactants used in the invention **prevent shrinkage** of molded flexible polyurethane foams, **avoiding the necessity for mechanical crushing**, and provide suitable alternatives to silicone-based surfactants.” (column 1, line 67 through column 2, line 3)

“To obtain a flexible foam adequately stabilized against collapse and having a good closed-cell structure, it is known to add a surfactant. A flexible foam having a **high number of closed cells, however, leads to shrinkage**. One means generally employed to open the cells and **eliminate foam shrinkage is to mechanically treat the foam by crushing with rollers**, with a vacuum technique, or by lancing. It would be desirable, however, to produce a surfactant that stabilizes the foam against collapse while **opening the cells of the foam without the necessity for mechanical treatment**.” (column 1, lines 13-23)

Thus, in this area of technology, addition of a surfactant will prevent shrinkage by **opening the cell structure**, without the need for crushing. It is also known that a high number of closed cells produces a foam subject to shrinkage.

Accordingly, since Heyman et al. is directed to a shrinkage reduce polyurethane foam and **adds a surfactant**, which was found to be necessary to produce such a foam, it is clear that

the foam of Heyman et al. has a predominantly open cell structure and does not have **at least 88% closed cells**.

While the official action asserts a closed cell structure is inherent to Heyman et al. appellants have provided evidence to the contrary.

Further, appellants have previously noted the physical characterization appearing in Table 2, at column 12 of Heyman et al. which describes air flow properties of 0.63-2.08, air flow being a property which can only be measured for foams having predominately open cells as closed cells prevent an air flow through the foam. While the examiner has noted that the air flow measurements are measured after crushing, leading the examiner to the conclusion that the reference is directed to a closed cell foam, the further characterization of the reference of "low shrinkage" leads to the contrary conclusion. If the foam of Heyman et al. were of a closed cell proportion of at least 88%, the foam of Heyman et al. would not perform as a low shrinkage foam. Samples 2 and 3 in Table 2, **inventive samples** according to Heyman et al. exhibited shrinkage distances of only 2/0 and 0/0 mm, clearly identifying these foams as low shrinkage. The absence of significant shrinkage is evidence that the Heyman et al foams do not have a closed cell proportion of at least 88%.

In contrast the claimed invention is directed to a process for producing **closed-celled** rigid polyurethane foams having a proportion of closed cells of at least 88%. Such foams are useful for thermal insulation and for construction and have fundamentally different properties from those of the foam of Heyman et al.

The examiner erroneously relies on unsupported conclusions in maintaining his rejection. Moreover, the examiner has erroneously weighed his unsupported conclusion more

heavily than appellants evidence. As the examiner's conclusion is not supported by any evidence and appellants have provided evidence as to the lack of anticipation, the examiner's conclusion is in error and must be reversed.

Notwithstanding the failure of Heyman et al. to describe a foam having a closed cell content of at least 88%, the reference fails to disclose a further claimed aspect of the invention as follows:

Heyman Et Al. Fail To Describe An MDI Having And NCO Content Of 29-33% And A Viscosity Of 150 To 1000 mPa·S

The official action, on page 2, asserts that based on the materials employed in the making of the foams of Heyman et al. **it is held** that the disclosure is inherently concerned with formation of articles that are closed celled to the degree claimed by applicants.

However, Heyman et al. never describes an MDI having an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s. Column 9, lines 5-30 of Heyman et al. describes the polyisocyanate component but nowhere describes the claim limitations of an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s. In the absence of a disclosure of this claim limitation the claimed process is clearly not rendered obvious by this reference.

There is no evidence to support the examiner's assertion that the claimed isocyanate component is inherent to Heyman et al.

As Heyman et al. fails to disclose or suggest a closed-celled rigid polyurethane foam having a proportion of closed cells of at least 88% producing process nor a polyisocyanate component having an NCO content of 29-33% and a viscosity of 150 to 1000 mPa·s, the

claimed invention is clearly neither anticipated nor rendered obvious from this reference. The decision of the examiner must be reversed.

The basic deficiencies of the primary reference are not cured by either of the secondary references, as neither describes a closed-celled rigid polyurethane foam.

EP 786,480 merely describes the preparation of a polymer polyol which may be used in the generic production of polyurethane articles such as a polyurethane foam, but there is no disclosure or suggestion of a closed-celled rigid polyurethane foam.

Claims 7 and 8

Further, while EP '480 has been cited for a disclosure of a narrow particle size distribution, claim 7 recites a distribution of from 0.1 to 8 μm while claim 8 recites a bimodal distribution. EP '480 describes a narrow particle size distribution ranging from 0.5 to 2.5 microns (see abstract). Thus, the reference identifies a range of only 2 microns as narrow. Such a narrow distribution does not render obvious the particle size distribution of claim 7 which is 7.9 microns wide, nor a bimodal particle size distribution which is nearly the antithesis of "narrow." Thus, while EP '490 has been cited for appellants' particle size distribution, the reference can not render obvious either of claims 7 or 8 and accordingly claims 7 and 8 are separately patentable for failing to suggest the claimed particle size distributions.

Isobe et al. is directed to the production of a high-durability **flexible** polyurethane cold cure molded foam (see Abstract) and therefore is not directed to a closed-celled **rigid** polyurethane foam. As these secondary references fail to disclose or suggest a closed-celled

rigid polyurethane foam, the basic deficiencies of the primary reference are not cured and accordingly the claimed invention is clearly not obvious from this combination of references.

In view of the examiner's errors the examiner's decision must be reversed.

The Rejection Of Claims 13 And 19 Under 35 U.S.C. § 102(B) Over Perry Et Al. U.S. 6,127,443

Claims 13 and 19

This embodiment of the claimed inventions is directed to a graft polyol having a specified hydroxyl value and a specified starter substance which may be used to produce closed-celled rigid polyurethane foams. Claim 13 claims a hydroxy value of 100 to 600 mg KOH/g and a starter selected from polyfunctional alcohol, sugar alcohols, aliphatic amines and aliphatic amines. The cited reference fails to disclose the claimed hydroxy value with the claimed starter substance.

Claim 13

This embodiment is directed to a graft polyol having a hydroxy value of 100 to 600 mg KOH/g and a starter selected from polyfunctional alcohol, sugar alcohols, aliphatic amines and aliphatic amines.

Perry does not describe a graft polyol having the claimed hydroxy value and a starter selected from polyfunctional alcohol, sugar alcohols, aliphatic amines and aliphatic amines.

Perry et al. fail to describe a graft polyol having a hydroxy number as claimed and a starter as claimed.

Perry et al describes a bicompositional polyol having different molecular weights and/or functionalities. (column 3, lines 34-36) The first polyol component fails to recite a hydroxy number (column 3, line 58 through column 4, line 63) and as such can not render obvious the claimed graft polyol having a recited hydroxy number. The second polyol component may have a hydroxy number of from 160 to 800 but fails to suggest such a polyol in which the starter is polyfunctional alcohol, sugar alcohol, aliphatic amine or aliphatic amine (column 4, line 64 through column 5, line 10).

As the references fail to identify the claimed starter compounds with the claimed hydroxy value, the graft polyol of claim 13 is not anticipated by this reference. The decision of the examiner must be reversed.

The Rejection Of Claims 14-15 Under 35 U.S.C. § 103(A) Over Perry et al. U.S. 6,127,443 In Further View Of Isobe et al U.S. 6,433,033

Claims 14-15

This embodiment of the claimed inventions is directed to a graft polyol having a specified hydroxyl value and a specified starter substance which may be used to produce closed-celled rigid polyurethane foams. Claim 14 recites a hydroxy value of 140 to 240 mg KOH/g and a starter of tolylenediamine. Claim 15 recites a hydroxy value of 140 to 240 mg KOH/g and a starter of trimethylolpropane.

None of the cited references discloses the claimed hydroxy value with the claimed starter substance.

Claim 14

This embodiment is directed to a graft polyol having a hydroxy value of 140 to 240 mg KOH/g and a starter of tolylenediamine.

Perry et al. fail to identify a starter compound of tolylenediamine.

The basic deficiencies of the primary references are not cured by the secondary reference.

Isobe et al. has been cited for a disclosure of starter molecules, however fails to suggest the claimed hydroxy values, a deficiency in Perry et al. with the starter compounds as claimed.

As the references fail to identify the claimed starter compounds with the claimed hydroxy value the graft polyol of claim 14 is not rendered obvious by these references and the decision of the examiner must be reversed.

Claim 15

This embodiment is directed to a graft polyol having a hydroxy value of 140 to 240 mg KOH/g and a starter of trimethylolpropane.

Perry et al. fail to identify a starter compound of trimethylolpropane.

The basic deficiencies of the primary references are not cured by the secondary reference.

Isobe et al. has been cited for a disclosure of starter molecules, however fails to suggest the claimed hydroxy values, a deficiency in Perry et al. with the starter compounds as claimed.

As the references fail to identify the claimed starter compounds with the claimed hydroxy value the graft polyol of claim 15 is not rendered obvious by these references. The decision of the examiner must be reversed.

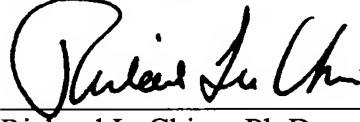
Application No. 10/478,694
Appeal of Office Action of December 7, 2007

In view of the errors committed by the examiner, his conclusions of obviousness are in error and must be reversed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Norman F. Oblon

A handwritten signature in black ink, appearing to read "Richard L. Chinn", is written over a horizontal line.

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(viii) Claims Appendix

Claim 1. A process for producing closed-celled rigid polyurethane foams by reacting

- a) crude MDI having an NCO content of from 29 to 33% by weight and a viscosity at 25°C in the range from 150 to 1000 mPa•s with
- b) compounds having at least two hydrogen atoms reactive toward isocyanate groups, in the presence of
- c) catalysts, and
- d) blowing agents,

which comprises the presence, among the compounds having at least two hydrogen atoms reactive toward isocyanate groups, of at least one graft polyol, wherein said closed-celled rigid polyurethane has a proportion of closed cells in the foam of at least 88%.

Claim 2. A process as claimed in claim 1, wherein the amount used of the graft polyol is up to 100% by weight, based on component b.

Claim 3. A process as claimed in claim 1, wherein the amount used of the graft polyol is from 0.5 to 70% by weight, based in each case on component b.

Claim 4. A process as claimed in claim 1, wherein the amount used of the graft polyol during the production of rigid polyurethane foams for use in refrigeration equipment is from 3 to 70% by weight, based on component b.

Claim 5. A process as claimed in claim 1, wherein the amount used of the graft polyol during the production of rigid polyurethane foams for use in sandwich components is from 0.5 to 35% by weight, based on component b.

Claim 6. A process as claimed in claim 1, wherein the graft polyol has a hydroxy value in the range from 20 to 210 mg KOH/g.

Claim 7. A process as claimed in claim 1, wherein the graft polyol particle distribution has a maximum at from 0.1 to 8 μm .

Claim 8. A process as claimed in claim 1, wherein the graft polyol has a bimodal particle size distribution.

Claim 9. A process as claimed in claim 1, wherein the graft polyol is prepared by in-situ polymerization of ethylenically unsaturated monomers in polyether alcohols having a functionality of from 2 to 8 and having a hydroxy value in the range from 100 to 800 mg KOH/g, obtained by an addition reaction of alkylene oxides onto H-functional starter substances, the starter substances having been selected from the group consisting of polyfunctional alcohols, sugar alcohols, aliphatic amines, and aromatic amines.

Claim 10. A process as claimed in claim 1 wherein the graft polyol is prepared by in-situ polymerization of ethylenically unsaturated monomers in polyether alcohols which are obtained by an addition reaction of alkylene oxides onto tolylenediamine, using basic catalysis.

Claim 11. A process as claimed in claim 1, wherein the graft polyol is prepared by in-situ polymerization of ethylenically unsaturated monomers in polyether alcohols which are obtained by an addition reaction of alkylene oxides onto trimethylolpropane, using basic catalysis or catalysis by multimetal cyanide complexes.

Claim 12. A rigid polyurethane foam produced by the process of claim 1.

Claim 13. A graft polyol comprising polymerized ethylenically unsaturated monomers in polyether alcohols having a hydroxy value in the range from 100 to 600 mg KOH/g, obtained by an addition reaction of alkylene oxides onto H-functional starter substances, the starter substances having been selected from the group consisting of polyfunctional alcohols, sugar alcohols, aliphatic amines, and aromatic amines.

Claim 14. A graft polyol as claimed in claim 13, prepared by in-situ polymerization of ethylenically unsaturated monomers in polyether alcohols having a hydroxy value in the range from 140 to 240 mg KOH/g, which are obtained by an addition reaction of alkylene oxides onto tolylenediamine.

Claim 15. A graft polyol as claimed in claim 13, prepared by in-situ polymerization of ethylenically unsaturated monomers in polyether alcohols having a hydroxy value in the range from 140 to 240 mg KOH/g, which are obtained by an addition reaction of alkylene oxides onto trimethylolpropane.

Claim 17. The process of claim 1, wherein said closed-celled rigid polyurethane has a proportion of closed cells in the foam of at least 95%.

Claim 18. The process of claim 1, wherein said graft polyol is prepared via in-situ polymerization of ethylenically unsaturated monomers in polyether alcohol.

Claim 19. The graft polyol of claim 13, wherein said graft polyol is prepared via in-situ polymerization of ethylenically unsaturated monomers in polyether alcohol.

Application No. 10/478,694
Appeal of Office Action of December 7, 2007

(ix) *Evidence Appendix*

Gallager U.S. 5,208,271

Application No. 10/478,694
Appeal of Office Action of December 7, 2007

(x) *Related Proceedings Appendix*

none